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Indian Standard

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(तीसरा पुनरीक्षण)

Carbon Papers — Handwriting — Specification

(Third Revision)

ICS 85.080

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Printing Inks, Stationery and Allied Product Sectional Committee, CHD 14

FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Printing Inks, Stationery and Allied Product Sectional Committee had been approved by the Chemical Division Council.

This standard was first published in 1966 and subsequently revised in 1976 during which the requirement of keeping quality was incorporated. Second revision of the standard was brought out in 1994 incorporating three amendments issued till date to this standard based on experience gained by the industry and consumers as also due to revision of IS 3413 ‘Base Paper for Carbon Paper’. Accordingly, the requirement for resistance to curling for Grade B carbon Paper was deleted.

This standard is being revised again to update the test method for determination of substance of base paper and mass of coating along with the technological advancements that have taken place since the last publication of the Standard.

The composition of the Committee responsible for the formulation of this Standard is given at Annex E.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

CARBON PAPERS — HANDWRITING — SPECIFICATION

(Third Revision)

1 SCOPE

This standard prescribes requirements and methods of sampling and test for carbon papers black, blue and purple, multiple use, for taking carbon copies with pencil or pen.

2 REFERENCES

The standards listed below contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to editions of the standards revision, and parties to agreements bas on this standards are encouraged to investing the possibility of applying the most recent indicated below:

IS No.	*Title*
1064 : 1980	Specification for paper sizes (*second revision*)
1375 : 2021	Black Lead Pencils — Specification (*second revision*)
3413 : 2004	Base paper for carbon paper (*second revision*)
4395 : 1987	Glossary of terms relating to inks and allied industries (*first revision*)
4905 : 2015	Random sampling and randomization procedures (*first revision*)

3 TERMINOLOGY

For the purpose of this standard, the definitions prescribed in IS 4395 shall apply.

4 GRADES

There shall be following three grades of carbon papers:

a) Grade A – Single side pencil carbon papers,

b) Grade B – Double side pencil carbon paper (for use where impression on the reverse side of the original is also required), and

c) Grade C – Single side pen carbon paper.

5 REQUIREMENTS

5.1 Description

The carbon paper shall be manufactured by coating tissue paper (on one or both sides as required) with a transferable carbon ink coating necessary to give the required copying qualities. The coating shall be smooth, uniform and free from smudginess. It shall have no tendency to offset or stain on normal handling when left in contact with copying sheets or separate as flakes when in use. The carbon paper shall be free from blemishes, like wrinkles, waves, tears and cuts and as far as possible, free from pinholes, creases, crimpled corners or sides, etc. when visually observed. Pinholes can be detected by exposing a single sheet of carbon paper to sunlight without magnification.

5.2 Base Paper

The base paper used in the manufacture of the material shall conform to Type 2 of IS 3413.

5.3 Size

The size of the carbon paper shall be as agreed to between the purchaser and the supplier. The tolerance allowed on the size shall be ± 1.5 mm in each direction (*see* IS 1064).

5.4 Carbon Work

The carbon work shall be well-defined and clear. Light shall not have any appreciable effect on the typed carbon work. There shall be a gradual, not abrupt, loss of distinctness of the carbon copies when repeated at the same place. Coating of carbon paper shall not affect in any way the white paper sheets used.

5.5 Resistance of Curling

The material of Grade A and Grade C shall comply with the requirement for resistance to curl tested according to the method prescribed in Annex A.

5.6 The material shall also comply with the requirements given in Table 1 when tested by the methods prescribed in the annexes. Reference to the appropriate annexes is given in column 6 of the Table 1.

6 KEEPING QUALITY

The material shall continue to satisfy all the requirements prescribed under **5** and shall also remain free from fungal growth for a period of not less than two years from the date of packing.

7 PACKING AND MARKING

7.1 Packing

Unless otherwise agreed to between the purchaser and the supplier, 25 or 100 sheets shall be suitably packed in a packet which may be either a folder or a cardboard box. When more than 25 sheets are packed in a packet, a demarcation sheet of distinctive colour of the size of carbon papers shall be included after every 25 sheets.

7.2 Marking

Each packet, shall be marked with the following information:

a) Name and colour of the carbon paper;
b) Grade and size;
c) Indication of the source of manufacture;
d) Batch number in code or otherwise to enable the lot of manufacture to be traced back from records; and
e) Month and year of packing.

7.3 BIS Certification Making

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

8 SAMPLING

The method of drawing representative samples of the material and the method of determining the conformity of the material to the requirements of this specification shall be as prescribed in Annex D.

ANNEX A

(*Clause* 5.5)

TEST FOR RESISTANCE TO CURLING

A-1 PROCEDURE

A-1.1 Place two sheets of carbon paper on a wire screen, carbon-coated side down, in a conditioning room in which relative humidity of 65 ± 2 percent and temperature of 27 ± 1 °C are maintained. After the sheets have been conditioned for one hour, remove the sheets from the screen and place on a flat glass surface, carbon-coated side-up. After one minute, measure the portions of the two narrow sides of each sheet which are in direct contact with the flat surface.

A-1.2 The material shall be considered satisfactory if not less than 80 percent of the sum of the total lengths of the narrow sides are in contact with the flat surface.

Table 1 Requirement for Carbon Papers for Handwriting

(*Clause* 5.6)

Sl No.	Characteristics	Requirements for			Method of Test (Ref to Annex)
		Grade A	Grade B	Grade C	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Substance of base paper, g/m^2	20.5 ± 1.5	20.5 ± 1.5	17.5 ± 1.0	B
ii)	Coating, g/m^2	13.5 ± 1	19 ± 1	13 ± 1	B
iii)	Durability (minimum number of impressions at the same spot)	10	6	6	C
iv)	Manifolding (minimum number of copies)	6	6	3	C

ANNEX B

[*Table* 1, *Items* (i) *and* (ii)]

DETERMINATION OF SUBSTANCE OF BASE PAPER AND MASS OF COATING

B-1 TEST PIECE

Condition a sheet of carbon paper as prescribed in **B-2.2.1** and cut out a test piece measuring 10.0 cm × 10.0 cm. Weigh it accurately.

B-2 DECOATING

Coating analysis for carbon paper having back staining and printing.

(To determine substance of base paper, carbon coating and staining cum printing of the carbon paper).

B-2.1 Reagents

B-2.1.1 *Petroleum Ether,* 100/120.

B-2.1.2 *Rectified Spirit*

B-2.2 Procedure

Cut 10.0 × 10.0 cm of carbon paper. Weigh it accurately (m1, GSM: M_1=100* m_1). Take a suitable quantity of Petroleum ether 100/120 in the beaker. Heat the above beaker containing petroleum ether 100/120 to boil. Wet a wad of surgical grade of cotton wool with petroleum ether 100/120, squeeze gently and by rubbing, remove carbon coating of the test piece which is kept on bunch of papers with carbon coated side facing upwards. Repeat with fresh wad of cotton wool, until maximum carbon coating is removed. Add rectified spirit to the above beaker containing petroleum ether 100/120 to make about 1 : 1 mixture. Heat the mixture to near boiling. Wet a fresh wad of cotton wool with the mixture, squeeze gently and by rubbing, remove complete coating of the test piece. Allow the test piece to dry and weigh it accurately (m_2, GSM: M_2=100* m_2). Again take fresh 1:1 mixture of petroleum ether 100/120 and rectified spirit (or same aforesaid mixture in the beaker), bring it to boil. Immerse the test piece (transfer side de-coated) into the boiling solvent until tissue is cleaned.

Repeat the operation with fresh quantity of solvents, if required. Allow the test piece to dry and condition it and weigh it accurately (m_3, GSM: M_3=100 *m_3).

B-2.2.1 *Conditioning*

Suspend the test piece in a conditioning chamber in which relative humidity of 65 ± 2 percent and temperature of 27 ± 1 °C are maintained (temperature should not vary by more than ± 1 °C in a given series of tests) in such a way that conditioning atmosphere has free access to all its surfaces. The test piece shall be deemed to have reached equilibrium when the results of two consecutive weightings at an interval of one hour do not differ by more than 0.4 percent of the total mass.

B-3 CALCULATION

Substance of base paper, g/m^2 = M_3
Carbon coating, g/m^2 = $M_1 - M_2$
Staining and printing, g/m^2 = $M_2 - M_3$

where

M_1 = mass in g, of the test piece after decoating;
M_2 = mass in g, of the test piece after drying; and
M_3 = mass in g, of the test piece after conditioning.

ANNEX C

[*Table* 1, *Items* (iii) *and* (iv)]

TEST FOR DURABILITY AND MANIFOLDING

C-1 TESTING APPARATUS

The tests in case of pencil carbon paper shall be made by actual writing with a hard pencil equivalent in grade to 2H pencil (*see* IS 1375) on a 52/54 g/m^2 white printing paper.

C-2 PROCEDURE

C-2.1 Test for Durability

Take a piece of about 4 to 5 cm from the carbon paper to be tested and fasten it to a sheet of white printing paper so that the coated side of the sample comes in contact with the copy sheet in the usual way. Place it on a glass plate with its long side parallel to one side of the plate. Draw out a line impression. Move the copy sheet slightly and draw a line over the same line. The carbon paper shall make not less than the required number of carbon copies from the same place that are clear, legible and of good intensity.

C-2.2 Test for Manifolding

Assemble the sheets of white printing papers and the required number of carbon papers and place them on a glass plate as in **C-2.1**. Write down about fifteen lines and examine the last copy sheet for legibility. The carbon papers shall satisfy the requirements of the test if all the characters are legible.

ANNEX D

(*Clause* 8)

SAMPLING OF CARBON PAPERS FOR HANDWRITING

D-1 GENERAL PRECAUTIONS

D-1.1 Samples shall be drawn from original unopened packets.

D-1.2 Samples shall be protected from abnormal exposure to heat and light, and shall not be allowed to come in contact with any liquid.

D-1.3 Samples shall be touched as little as possible, and contact with sweated hands shall be avoided.

D-1.4 Samples shall not be folded before testing.

D-2 SCALE OF SAMPLING

D-2.1 Lot

All the packets in a single consignment of the same size, same grade, and from the same batch of manufacture, shall constitute a lot.

D-2.1.1 Samples shall be tested from each lot separately for ascertaining the conformity of the lot to the requirements of this specification.

D-2.2 The number of packets to be selected from a lot for sampling shall depend upon the size of the lot and shall be in accordance with col 1 and 2 of Table 2.

D-2.3 These packets shall be selected at random from the lot and, for this purpose, random sampling procedures as specified in IS 4905 shall be used.

D-2.4 From each of the packets selected under **D-2.3**, approximately equal number of sheets shall be taken so as to constitute the required sample given in col 3 of Table 2.

D-3 NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

D-3.1 All the sheets selected according to col 2 and 3 of Table 2 shall be examined for requirements given **5.1** to **5.6**. A sheet failing to meet any one or more of the requirements shall be considered as defective.

D-3.2 A lot shall be declared as conforming to the requirements of this specification if the number of sheets found defective under **D-3.1** is less than or equal to the corresponding permissible number of defective sheets given in col 4 of Table 2.

Table 2 Scale of Sampling and Permissible Number of Defectives

(*Clauses* D-2.2, D-2.4, D-3.1 *and* D-3.2)

Sl No. (1)	No. of Packets in the Lot (2)	No. of Packets To be Selected (3)	No. of Sheets in the Sample (4)	Permissible No. of Defective Sheets (5)
i)	up to 15	3	5	0
ii)	16 to 25	6	8	0
iii)	26 to 100	10	13	0
iv)	101 to 300	15	20	1
v)	301 to 500	20	32	2
vi)	501 and above	30	50	3

ANNEX E

(*Foreword*)

COMMITTEE COMPOSITION

Printing Inks, Stationery and Allied Product Sectional Committee, CHD 14

Organization	*Representative(s)*
Govt Printing, Govt of West Bengal	Shri Subir Kumar Mandal (***Chairman***)
All India Federation of Master Printers, New Delhi	Shri Harjinder Singh
All India Printing Ink Mfgrs Association Ltd, Mumbai	Shri Ravindra Gandhi Shri R. Sridharan (*Alternate*)
All India Print-Tech Professionals Forum, Kolkata	Shri Partha Pratim Sanyal
CONSUMER VOICE	Shri M. A. U. Khan Shri K. C. Chaudhary (*Alternate*)
DIC India Limited	Shri U. Chowdhuri Shri Saroj Panda (*Alternate*)
Directorate of Printing, New Delhi	Shri D. K. Jain Shri K. K Puri (*Alternate*)
Flint Group	Shri Sanjeev Bansal Shri Dinesh Ahuja (*Alternate*)
Government of Indian Stationery Office, Kolkata	Shri Bishamber Dhar
Hubergroup India Pvt Ltd	Shri Rajeev Sharma Shri Rajeev Ranjan (*Alternate*)
Indian Institute of Packaging	Dr Tanweer Alam Shri Subodh Kamalakar Juikar (*Alternate*)
Kokuyo Camlin Limited, Mumbai	Shri Manik J. Salunkhe Mrs Sayali Suraj Sarfare (*Alternate*)
Kumarappa Handmade Paper	Dr Saakshy Agarwal
National Archives of India, New Delhi	Shri Ram Swaroop Dr Sutapa Chakravarty (*Alternate*)
National Test House	Shri Buddh Prakash
Sakata Inx (India) Ltd, New Delhi	Shri Vijay Shankar Gupta Shri Sunil K. Chhabra (*Alternate*)
Security Printing and Minting Corpn India Ltd, Delhi (SPMCIL)	Shri S. Mahapatra Dr D. K. Rath (*Alternate*)
Shriram Institute for Industrial Research, Delhi	Dr Manmohan Kumar Dr Vinay Tyagi (*Alternate*)
SICPA India Ltd, New Delhi	Shri Arun Vig Shri A. B. Sachan (*Alternate*)
Siegwerk Inks, Bhiwadi	Shri Jatin Takkar Dr Joerg Peter Langhammer (*Alternate*)
The Regional Institute of Printing Technology	Shri Shankhya Debnath Shri Krishnendu Halder (*Alternate*)
Times Group	Shri Snehasis Roy Shri Anup Kumar Pal (*Alternate*)
Toyo Ink India Pvt Ltd, Uttar Pradesh	Shri K. S. Murthy Shri Vivek Rastogi (*Alternate*)

Organization	*Representative(s)*
Western Printing Group, Survey of India, Delhi	Shri Equerar Ahmad
Whale Stationery Products Ltd, Delhi	Shri Mukesh Gupta Shri Aseem Gupta (*Alternate*)
Yansefu Inks and Coating Pvt Ltd	Shri Jitendra Sharma Shri Neelakamal Mohapatra (*Alternate*)
In personal capacity	Dr R. N. Ghosh
In personal capacity	Shri A. K Sinha, Ex-Director (Printing), Directorate of Printing (*Alternate*)
BIS Directorate General	Shri A. K. Lal, Scientist 'E' and Head (CHD) [Representing Director General (*Ex-officio*)]

Member Secretary

Shri Sagar Singh
Scientist 'C' (CHD), BIS

Bureau of Indian Standards

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